

# **Overview of the Electric Industry**

**A Presentation to the House Energy  
and Technology Committee  
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**Legislative Service Bureau (LSB)**

# Outline

- Three Segments of Electric Industry
  - Generation
  - Transmission
  - Distribution
- Jurisdiction
- Introduction of Competition in the Electric Industry
- PA 141 of 2000
- PA 286 of 2008

# Electric Power Measured in units of Watts...

200 – 400 W



**Watts (W)**

100 W



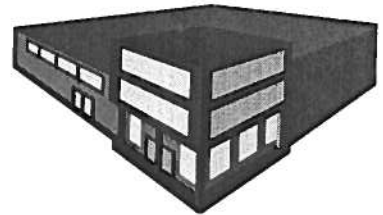
**Kilowatts (KW)**

~ 2 KW



**1000 W = 1 KW**

500 – 1,500 KW



**Megawatts (MW)**

**1000 KW = 1 MW**

1 – 100 MW



# Power Used over Time is measured in...

**Watt  
Hours  
(Wh)**



200 Wh = 100 W bulb  
burning for 2 hours.

**Kilowatt Hours  
(KWh)**

**1000 Wh = 1 KWh**



Annually,  
around 10,000  
KWh

**Megawatt Hours  
(MWh)**

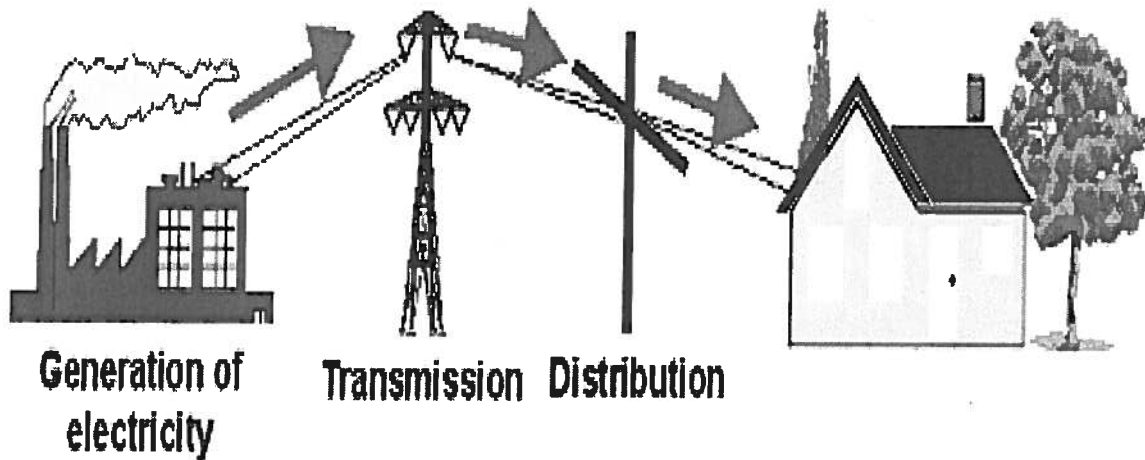
**1000 KWh = 1 MWh**



Annually as much as  
15,000 MWh

# Electric Industry

## Generation and Transportation of Electricity



### **Generation:** The Commodity of Power

- Power Plants
- Turbine Spins Magnet around Copper Coils to generate electric current - AC - 60 Hz

### **Transmission:** Transport the commodity

- High Voltage
- Bulk Transport
- Long Range - Nationwide Network

### **Distribution:** Transport and distribute the commodity

- Low Voltage
- Distribute to end users
- Short Range - Local Network

# Electric Industry Unique...

- Cannot Store Electricity  
(in general)
- Electricity travels the path of  
least resistance
- Customers “demand” electricity  
whenever they want it
- Electric Industry must be ready  
and able to provide electricity  
at all times, even peak  
demand.

# Generation - Power Plants

## **Base Load Plants**

- Typically Coal or Nuclear
- Large ~ 1000 MW (1 GW)
- Operate 24/7

## **Peaking Plants**

- Typically Natural Gas
- Smaller ~100 - 500 MW
- Typically only operated for peak demand

# Transmission...

- The **GRID** = High voltage *transmission* lines
- Interconnected
  - connects power plants & utilities across nation
- Increases reliability

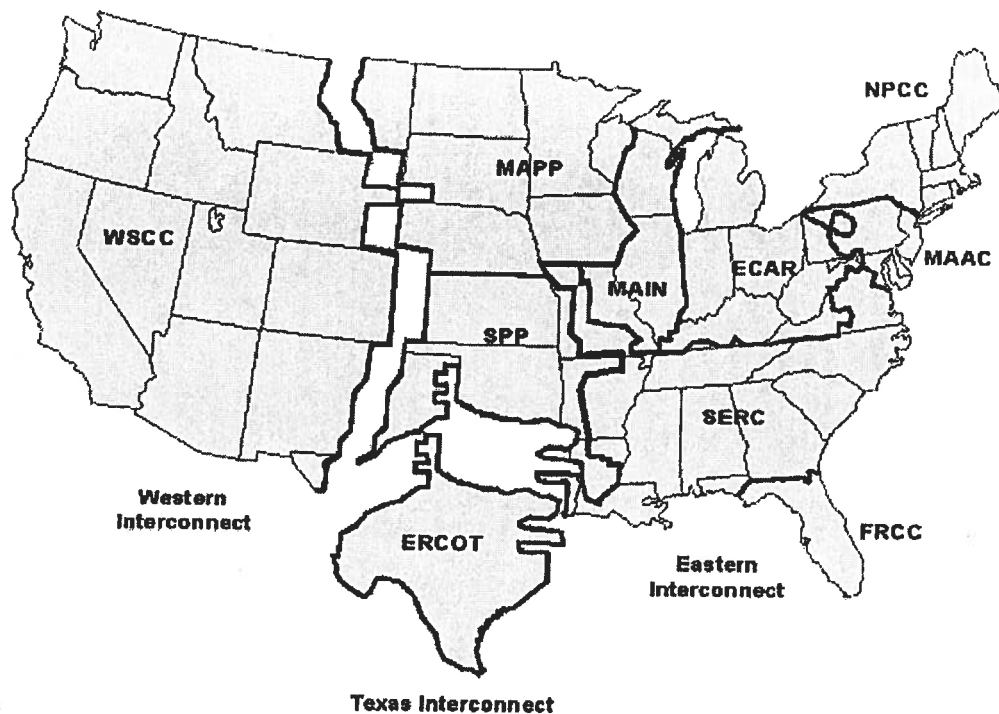
# Three U.S. Grids

## 1. Eastern Interconnect

Includes Michigan

## 2. Western Interconnect

## 3. Texas Interconnect



# Distribution...

- Transformers take high voltage transmission and drop it down to low voltage
- Typically most outages occur due to disruptions in the distribution network
  - Weather
  - Trees

# Federal Jurisdiction

What Federal Act Grants Authority?

- Federal Power Act of 1935

Who is Regulating Agency?

- Federal Energy Regulatory Commission (**FERC**)

What is under federal purview?

- Wholesale Generation - bulk power sales
- Transmission
- Licensing of hydroelectric facilities
- Nuclear Power Plants (NRC - Nuclear Regulatory Commission)

# State Jurisdiction

## What State Act Grants Authority?

- 1939 PA 3 Public Service Commission Act
- 1909 PA 106 Electric Transmission Act

## Who is Regulating Agency?

- Michigan Public Service Commission  
**(MPSC)**

## What is under state purview?

- Investor-Owned Utilities
- Co-ops
- Retail Generation – retail power sales
- Distribution
- Metering
- Siting of Power Plants & Transmission facilities.

# Old Paradigm—

## Vertically Integrated Monopoly

- **Generation**
  - **Transmission**
  - **Distribution**
- All Provided *and*  
Owned by  
Investor Owned  
Utility

- The Only Participants in the  
Electric Industry generally were  
**UTILITIES**

# Federal Government

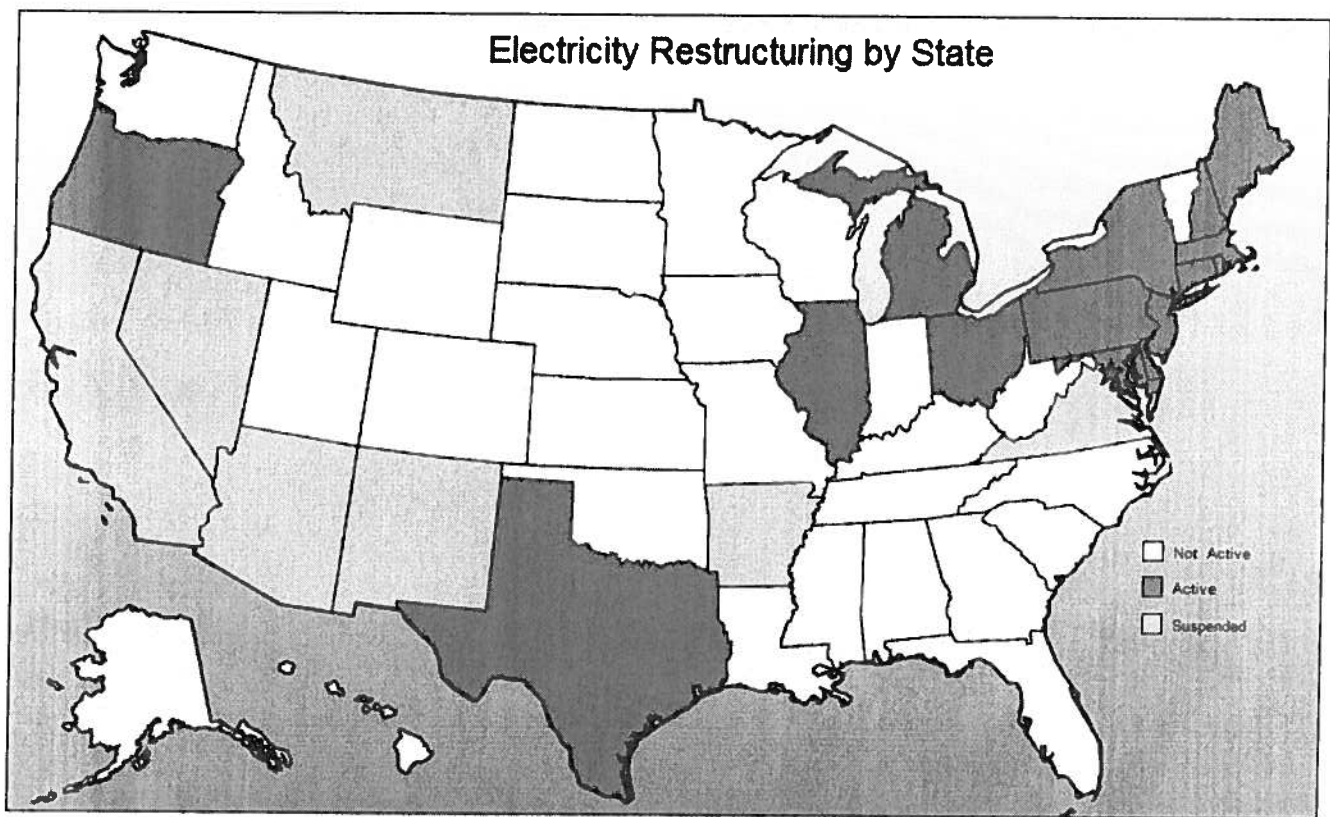
## Began Opening the Industry up to Non-utility Entities

- 1978 - Public Utilities Policy Act (PURPA)
  - Allowed non-utility generators to produce power; e.g., Qualifying Facilities (QFs) - small renewable, or co-generators
- 1992 - Energy Policy Act 1992
  - Allowed more non-utility generators, Exempt Wholesale Generators (EWGs)
- 1996 – FERC Orders 888, 889
  - Open Access to Transmission Grid

# State Electric Industry *Restructuring*

- Following lead of Federal Government, **states began allowing non-utilities to sell electricity at the retail level**
- California – 1998 (Suspended)
- Pennsylvania – 1999
- Michigan – 2000

# 15 states allow retail customers to **CHOOSE** who they buy electricity from



As of September 2010; From U.S. Energy  
Information Administration (EIA)

# History of **Customer Choice** in Michigan...

1992 ABATE petitions MPSC

1996 Michigan Jobs Commission  
report favors competition

1996 MPSC public hearings

1998 MPSC Order Implementing  
Customer Choice

1999 Michigan Supreme Court  
Decision

- MPSC does not have legal  
authority to implement  
“choice”

2000 PA 141

2000 PA 141  
*“Customer Choice and  
Electricity Reliability Act”*  
and  
2000 PA 142  
MCL 460.10 to 460.10cc

- Amend PA 3 of 1939  
MCL 460.1 to 460.10cc
- PA 141: Restructure Industry
- PA 142: Securitization - enabled  
the financing of restructuring

# PA 141 Key Provisions

## MCL 460.10a

- MPSC shall issue orders allowing electric customers to be able to choose an Alternative Electric Supplier (AES)
- Alternative Electric Suppliers
  - non-utilities licensed by MPSC
  - generally buy wholesale power for resale
  - *may* own merchant plants in Michigan or other states

# PA 141 Key Provisions

## MCL 460.10b

- MPSC shall unbundle rates to separately identify generation, transmission, and distribution charges—make it easier for customers to compare prices between AES and utility

# PA 141 Key Provisions

## MCL 460.10w

- Consumers Energy, Detroit Edison and Indiana & Mich. Power must either divest transmission assets or join a Regional Transmission Organization (RTO)

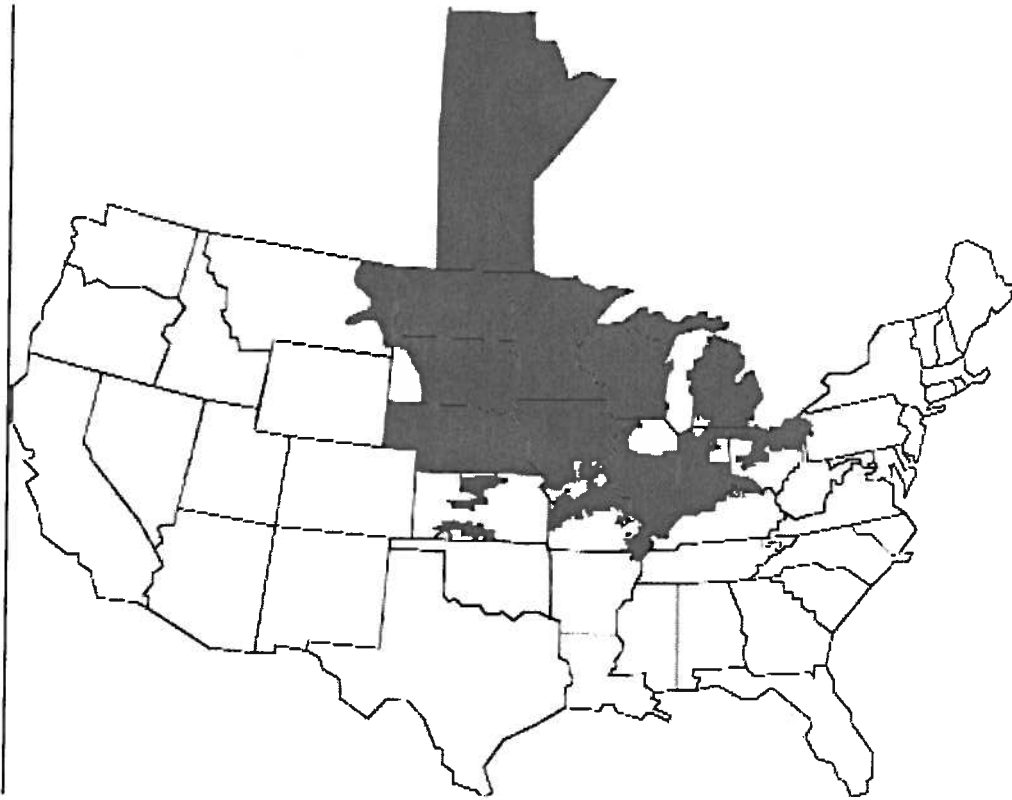
## RTO

- FERC Developed Concept - Help support deregulation
- Operate Grid - Large, Independent, Regional
- Grid Control shifts from IOUs to RTOs

# PA 141 Key Provisions

- Detroit Edison and Consumers Energy joined MISO AND Sold Transmission Lines
  - ITC now Owns Most Transmission Lines in Michigan
  - The American Transmission Co. (ATC) owns transmission in upper peninsula
- Indiana & Mich. joined PJM Interconnection but kept ownership of its transmission lines.

# Midwest Independent Transmission System Operator (**MISO**)



**MISO Footprint**

Source: Midwest ISO Corporate Information

Operating in 15 states and the  
province of Manitoba  
130,000 – 160,000 MW of generation  
~100,000 miles transmission

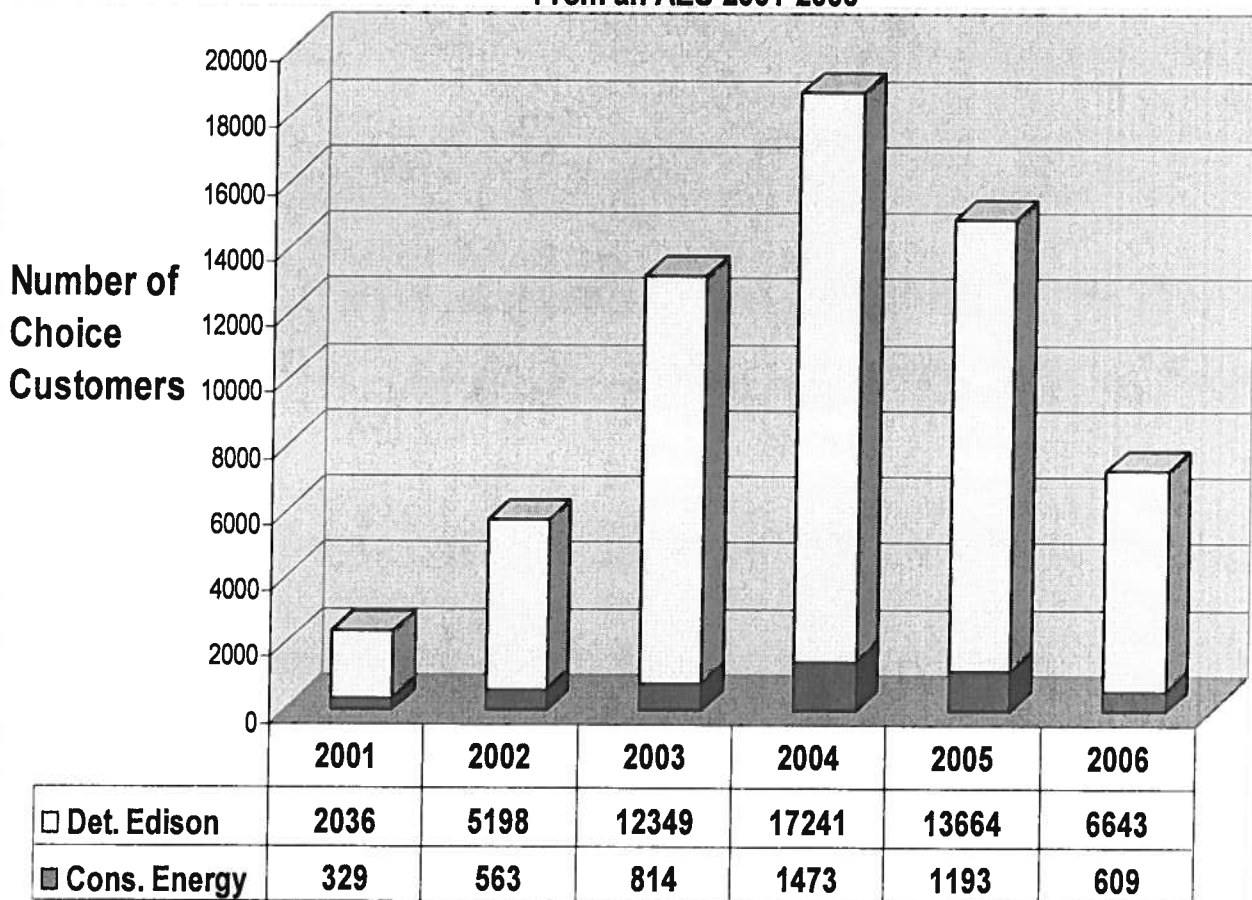
# 2000 PA 141

- *Hybrid System-*
  - *Retail customers can choose an alternative electric supplier, OR remain with their regulated utility*
- *“Choice for those who want it, protection for those who do not.”*

# Only Commercial and Industrial Customers In Choice Program

## Customer Choice Peaked in 2004

Numbers of Customers Leaving Utility and Buying Electricity  
From an AES 2001-2006



# *Changing PA 141*

- Unclear who will build new base load power plant
  - Utilities Have Obligation To Serve
  - Customers may migrate to and from Utility causing revenue uncertainty
  - Obtaining financing to construct base load plant difficult with uncertain revenue

# Major Energy Legislation Enacted in 2008

## **PA 286 –**

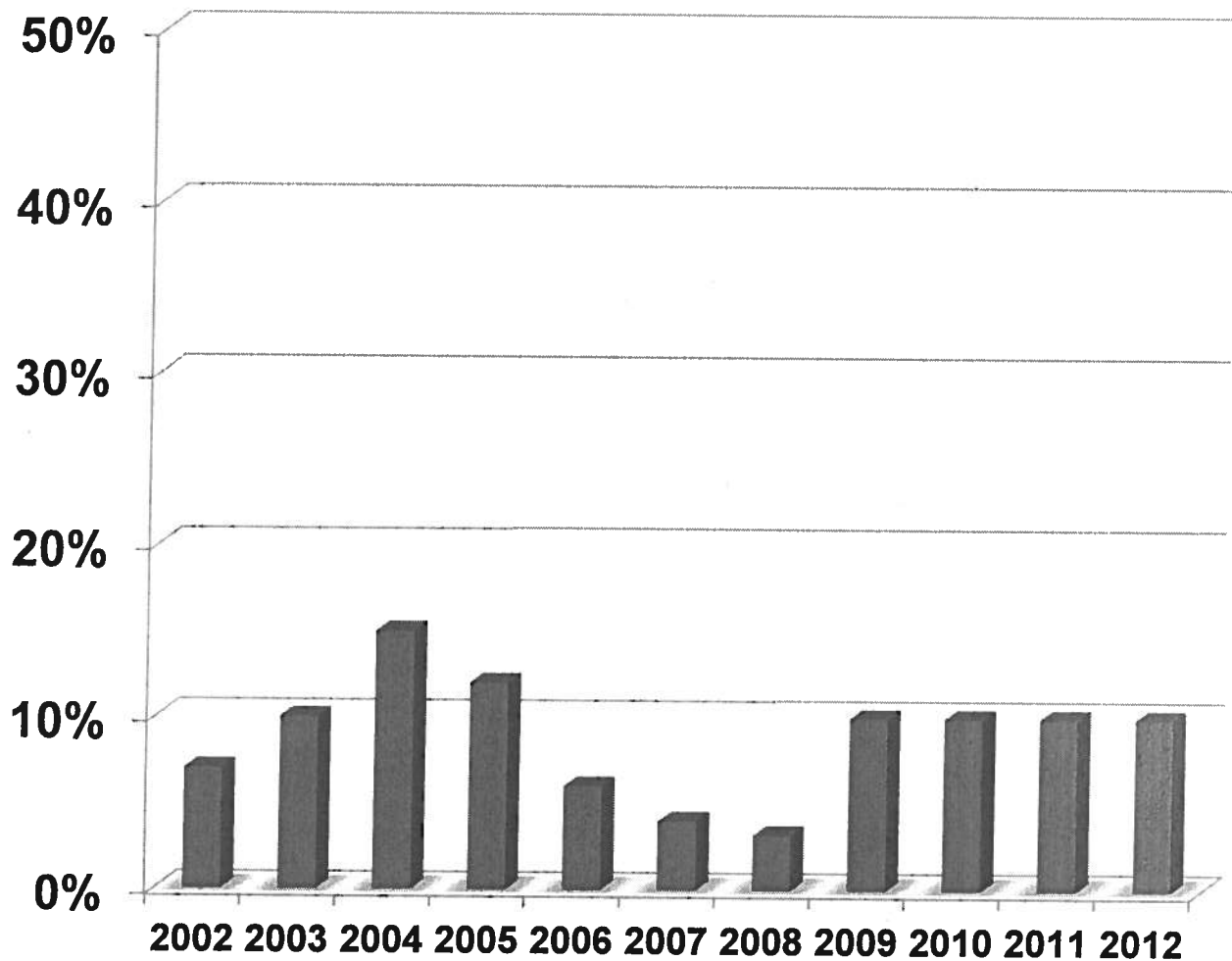
- 10% Cap on Customer Choice
- Rate De-skewing
- Certificate of Necessity
- Integrated Resource Plan

also

**PA 295** - *Clean, Renewable and Efficient Energy Act* –established 10% RPS; Energy Efficiency Programs, Net Metering

# PA 286 of 2008

No more than 10 percent of the retail electric market is available to AESs



**Customer Choice Sales  
% Retail Sales (% MWh)  
Detroit Edison and Consumers Energy**

## According to MPSC annual report on competition...

- 26 Licensed AESs
- AESs served just over 6,800 customers in 2012.
- During 2012, AESs began serving in I&M and UPPCo territories
- Only Commercial and Industrial customers being served by AES
- As of December 2012, approximately 10,450 customers in the queue

# PA 286 of 2008

- Kevin Studebaker – Legal Division

# Thank You!

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